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A STUDY ON SERVICE OFFERED BY BUS BODY BUILDERS IN KARUR DISTRICT, TAMIL NADU

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ABSTRACT

In a developing economy like India, road passenger transport deserves a high priority, as it forms the backbone of the passenger mobility system and is the principal carrier across the country. Even after five and a half decades of nationalization, passenger mobility suffers both in quantum and quality because the supply of road passenger transport facilities is not keeping pace with the rising demand.

INTRODUCTION

Yet in today's competitive environment, market place advantages are often short-lived. With this in mind, many practitioners and academic researchers are selling continuous improvement strategies to stay ahead of the competition. To drive continuous improvement, academic researchers are placing more importance on measuring organizational performance from the customer's perspective. As a result, customer value and satisfaction research is the most prevalent type of research conducted by companies today. Customers decide who has the best offering, and they are the ultimate judge of quality products and services. Happy satisfied customer will improve the bottom line of an organization. Disaffected ones will prophesy a company's quick descent into the loss-making pit.

The quality of service delivered to external customer is often determined by the quality of service that internal customers (employees) provide each other. When discussing about customers it is important to remember that, everyone within an organization provides a service. There are 'internal' as well as 'external' customers. So by this case, the paper is to identify the factors that are required to increase internal customer satisfaction especially on actions that are taken by the management in ISO certified manufacturing companies.

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The bus bodywork manufacture industry needs to strategically combat a proliferation of product variants, rationalise manufacture and communicate more effectively with downstream users. Bus bodywork – the process of building a frame, interior and vehicle systems on to an existing chassis – stands to benefit strongly from the implementation of Mass Customisation (MC) and product architecture (Pine, 1993; Ulrich and Eppinger, 1995).

Being a customer-focussed industry, the diversity in bus specification across different operators has led to a proliferation of designs for the route bus, essentially the same product (Napper, 2007). Consequences of this product variety include a disproportionate engineering workload to the profit of a production 'run'; a specification system dependent on engrained practices rather than explicit information; and lower value for money to the customer and margin for the manufacturer. In recognition of these problems, the Future Bus project aims to create new designs for route bus bodywork, implementing strategies of MC in new product development.

There are several key differences between the route bus bodywork industry namely *(1) External Appearance (EA), (2) Internal Appearance (IA), (3) Improving Seating (IS), (4) Climate Control (CC), (5) Alighting (AL, (6) Services (SE), (7) Safety (SA), (8) After Sales and Services (ASS), Media of Advertising (MA), Pricing of the Products (PP), Availability of Credit Facility (ACF), Expected Features (EF) and Technology (TE).*

Road network is vital to the economic development, trade and social integration. It facilitates smooth conveyance of both people and goods. Size of the road network, its quality and access has a bearing on transport costs. Besides, road network promote specialization, extend markets and thereby enable exploitation of the economies of scale. Easy accessibility, flexibility of operations and reliability have earned road transport an increasingly higher share of bus transport operators and freight traffic vis-à-vis other transport modes. Availability of adequate, safe and comfortable bus transport operators' facility is a very important index of economic development of any Country. Bus transport operators provide the vital connectivity to far flung areas in a developing society. Transport demand in India has been growing rapidly. In recent years this demand has shifted mainly to the advantage of road transport, which carries about 87 percent of passenger and 61 per cent freight transport demand arising for land based modes of transport (i.e. roadways and railways taken together) respectively.

1.1 Objectives of the Study

1) To study the trend and growth of bus body building industry in Tamil Nadu.
2) To study the services offered by bus body builders in Karur District to bus transport operators.
3) To analyze the perceptions of bus transport operators on the services offered by bus body builders in Karur District and
4) To offer suggestions to enhance the quality of services offered by bus body builders in Karur District.

METHODS

2.1 Methodology and Sampling

1) Survey method is followed

2) Both primary and secondary sources of data are used
3) Purposive sampling was adopted
4) Sample respondents for the study are randomly chosen in Tamil Nadu

2.2 Tools Used for Data Collection

Finally, in the eight Questions pertaining to respondents' demographic profile information was given. All the dimensions were presented as statements on the questionnaire, with the same rating scale used throughout and measured on a seven point, Likert-type scale that varied from 1 highly dissatisfied to 5 highly satisfied and Strongly Disagree to Strongly Agree. For conducting an empirical study, data were collected from respondents of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders.

2.3 Statistical Tools Used for Analysis and Interpretation of Data

The data collected were analyzed for the entire sample. Data analyses were performed with Statistical Package for Social Sciences (SPSS 20.0) using techniques that included descriptive statistics and Correlation analysis and testing.

2.4 Factor Analysis

Factor analysis provides two distinct, but interrelated outcomes: data summarization and data reduction. Factor Analysis is used to identify the under lying factors or variables, that explains the pattern of correlation within a set of observed variables. It is often used in data reduction to identify a small number of latent variables that explain most of the variance that is observed in a much larger number of manifest variables.

2.5 ANOVA Test

ANOVA is used when we want to compare means of more than two groups or levels of an independent variable. It is also used for finding significant relation between various variables.

2.6 Hypotheses of the Study

The formulation of hypotheses or propositions as to the possible answers to the research questions is an important step in the process of formulation of the research problem. Keen observation creative thinking, hunch, with imagination, vision, insight and sound judgment are of greater importance in setting up reasonable hypotheses. A thorough knowledge about the phenomenon and related fields is of great value in its process. The formulation of hypotheses plays an important role in the growth of knowledge in every science. The following hypotheses had been made for the research process.

- There is no significant relationship between External Appearance of the respondents and the Satisfactory Level of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders.
- There is no significant relationship between Internal Appearance of the respondents and the Satisfactory Level of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders.

- There is no significant relationship between Climate Control of the respondents and the Satisfactory Level of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders.
- There is no significant relationship between Services of the respondents and the Satisfactory Level of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders.
- There is no significant relationship between Safety of the respondents and the Satisfactory Level of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders.

2.7 Scope of the Study

The present study covers only the samples drawn from the population in karur district – either government operated or private operated bus services. The scope of this master thesis is to investigate overall customer satisfaction with conventional bus transport in India. Since India has a wide range of transport, the study will be conducted to measure the conventional bus transport. The study of conventional bus transport is important sign to makes it up since, the conventional bus transport one is majority of the bus transport in India.

RESULTS

3.1 T – Test Analysis

Table – 1: *One-Sample T test Statistics for Satisfactory Level of Tamilnadu Bus Transport Operators towards Karur Bus Body Builders*

	N	Mean	SD	SEM	T - Value	Sig.
External Appearance	400	28.0125	3.02410	.15121		
Internal Appearance	400	20.1025	2.53338	.12667	185.261	.000
Climate Control	400	9.8575	1.56631	.07832	138.546	.000
Services	400	35.4525	4.11218	.20561	129.401	.000
Safety	400	9.5350	1.86076	.09304	172.427	.000
Source: *SPSS output (20.0), Significance at 1% level*						

3.1.1 Implications of T-Test

(a) External Appearance

The researcher found out that the output for the independent – sample T test. This output consists of independent sample T test. The statistics output provides the sample sizes (N), means, standard deviations and the standard error of the mean for the continuous variable. With respect to above the research External Appearance, there were 400 frequencies is our sample, and External Appearance mean of 28.0125, with a standard deviation of 3.02410, SEM (Standard Error Mean) of 0.15121, T value of 185.261 and significance level of 0.000 respectively. There is strong evidence (t=185.261, p=0.000) that the intervention improves External Appearance. In this data set, it improved External Appearance, on average, by approximately 28.0125 points. Of course, if the researcher is to take other samples of External Appearance, the researcher could get main parried difference in External Appearance from 28.0125. This confirms that, although the difference

in External Appearance is statistically significant, it is actually relatively small. This research would need to consider if this difference in External Appearance is practically important, not just statistically significant.

(b) Internal Appearance

The researcher found out that the output for the independent – sample T test. This output consists of independent sample T test. The statistics output provides the sample sizes (N), means, standard deviations and the standard error of the mean for the continuous variable. With respect to above the research Internal Appearance, there were 400 frequencies is our sample, and Internal Appearance mean of 20.1025, with a standard deviation of 2.53338, SEM (Standard Error Mean) of 0.12667, T value of 158.701 and significance level of 0.000 respectively. There is strong evidence (t=158.701, p=0.000) that the intervention improves Internal Appearance. In this data set, it improved Internal Appearance, on average, by approximately 20.1025 points. Of course, if the researcher is to take other samples of Internal Appearance, the researcher could get main parried difference in Internal Appearance from 20.1025. This confirms that, although the difference in Internal Appearance is statistically significant, it is actually relatively small. This research would need to consider if this difference in Internal Appearance is practically important, not just statistically significant.

(c) Climate Control

The researcher found out that the output for the independent – sample T test. This output consists of independent sample T test. The statistics output provides the sample sizes (N), means, standard deviations and the standard error of the mean for the continuous variable. With respect to above the research Climate Control, there were 400 frequencies is our sample, and Climate Control mean of 9.8575, with a standard deviation of 1.56631, SEM (Standard Error Mean) of 0.7832, T value of 125.869 and significance level of 0.000 respectively. There is strong evidence (t=123.869, p=0.000) that the intervention improves Climate Control. In this data set, it improved Climate Control, on average, by approximately 9.8575 points. Of course, if the researcher is to take other samples of Climate Control, the researcher could get main parried difference in Climate Control from 9.8575. This confirms that, although the difference in Climate Control is statistically significant, it is actually relatively small. This research would need to consider if this difference in Climate Control is practically important, not just statistically significant.

(d) Services

The researcher found out that the output for the independent – sample T test. This output consists of independent sample T test. The statistics output provides the sample sizes (N), means, standard deviations and the standard error of the mean for the continuous variable. With respect to above the research Services, there were 400 frequencies is our sample, and Services mean of 35.4525, with a standard deviation of 4.11218, SEM (Standard Error Mean) of 0.20561, T value of 172.427 and significance level of 0.000 respectively. There is strong evidence (t=172.427, p=0.000) that the intervention improves Services. In this data set, it improved Services, on average, by approximately 35.4525 points. Of course, if the researcher is to take other samples of Services, the researcher could

get main parried difference in Services from 35.4526. This confirms that, although the difference in Services is statistically significant, it is actually relatively small. This research would need to consider if this difference in Services is practically important, not just statistically significant.

(e) Safety

The researcher found out that the output for the independent – sample T test. This output consists of independent sample T test. The statistics output provides the sample sizes (N), means, standard deviations and the standard error of the mean for the continuous variable. With respect to above the research Safety, there were 400 frequencies is our sample, and Safety mean of 9.5350, with a standard deviation of 1.86076, SEM (Standard Error Mean) of 0.09304, T value of 102.485 and significance level of 0.000 respectively. There is strong evidence (t=102.485, p=0.000) that the intervention improves Safety. In this data set, it improved Safety, on average, by approximately 9.5350 points. Of course, if the researcher is to take other samples of Safety, the researcher could get main parried difference in Safety from 9.5350. This confirms that, although the difference in Safety is statistically significant, it is actually relatively small. This research would need to consider if this difference in Safety is practically important, not just statistically significant.

3.2 One-way ANOVA Test Analysis

Table – 2: *ANOVA for Services of Satisfactory Level of Tamil Nadu Bus Transport Operators towards Karur Bus Body Builders*

		Sum of Squares	df	Mean Square	F	Sig.
External Appearance	Between Groups	1050.858	18	58.381	8.561	.000
	Within Groups	2598.080	381	6.819		
	Total	3648.938	399			
Internal Appearance	Between Groups	645.254	18	35.847	7.130	.000
	Within Groups	1915.543	381	5.028		
	Total	2560.798	399			
	Within Groups	2683.652	381	7.044		
	Total	3337.510	399			
Climate Control	Between Groups	120.553	18	6.697	2.973	.000
	Within Groups	858.324	381	2.253		
	Total	978.878	399			
	Within Groups	1038.538	381	2.726		
	Total	1686.000	399			
Safety	Between Groups	211.995	18	11.777	3.837	.000
	Within Groups	1169.515	381	3.070		
	Total	1381.510	399			
	Total	1636.398	399			
Source: *SPSS Output (20.0)*						

(a) External Appearance

Above the table shows that one-way between groups analysis of variance was conducted to explore the impact of age for External Appearance. Participants were divided into four groups according to their age. There was a statistically significant difference at the $p < .001$ level in External Appearance for four age groups F (8.561), $p < .001$. Despite reaching statistical significance, the actual difference in mean scores between groups was quite small. The effect size, calculated using eta squared, was .04. ANOVA test indicated that the mean score for Between Groups (M = 58.381) was significantly different from Within Groups (M = 6.819). There was no statistically significant difference in mean.

(b) Internal Appearance

Above the table shows that one-way between groups analysis of variance was conducted to explore the impact of age for Internal Appearance. Participants were divided into four groups according to their age. There was a statistically significant difference at the $p < .001$ level in Internal Appearance for four age groups F (7.130), $p < .001$. Despite reaching statistical significance, the actual difference in mean scores between groups was quite small. The effect size, calculated using eta squared, was .04. ANOVA test indicated that the mean score for Between Groups (M = 35.847) was significantly different from Within Groups (M = 5.028). There was no statistically significant difference in mean.

(c) Climate Control

Above the table shows that one-way between groups analysis of variance was conducted to explore the impact of age for Climate Control. Participants were divided into four groups according to their age. There was a statistically significant difference at the $p < .001$ level in Climate Control for four age groups F (2.973), $p < .001$. Despite reaching statistical significance, the actual difference in mean scores between groups was quite small. The effect size, calculated using eta squared, was .04. ANOVA test indicated that the mean score for Between Groups (M = 6.697) was significantly different from Within Groups (M = 2.253). There was no statistically significant difference in mean.

(d) Safety

Above the table shows that one-way between groups analysis of variance was conducted to explore the impact of age for Safety. Participants were divided into four groups according to their age. There was a statistically significant difference at the $p < .001$ level in Safety for four age groups F (3.837), $p < .001$. Despite reaching statistical significance, the actual difference in mean scores between groups was quite small. The effect size, calculated using eta squared, was .04. ANOVA test indicated that the mean score for Between Groups (M = 11.777) was significantly different from Within Groups (M = 3.070). There was no statistically significant difference in mean.

FINDINGS

This research investigated several bodies of literature to find applicable non transportation methods and models of customer satisfaction. The expectancy disconfirmation model found in product-based literature serves as the structure for an

empirical methodology in the transportation context. Utilizing existing resources, the vast customer surveys already conducted by transportation agencies, was a selection factor for potential models.

The proposed Bus Transports Operators Satisfactory Level framework identified three opportunities to incorporate customer satisfaction into the transportation planning framework. Bus Transports Operators Satisfaction application in the data, analysis methods and evaluation stages improve the existing transportation planning process's ability to integrate customer satisfaction throughout the process. This framework provides a transparent process that can be used in resource justification and social equity determination giving decision makers the tools necessary to address broader goals of transportation agencies.

This framework was developed based on the responses of targeted customer satisfaction practitioners regarding their practices in collection and analysis of bus transport operator's data. It was also developed based on the review of practitioner's planning documents that frame the vision, goals and performance measures in use. And most importantly, the framework depends upon the methodology created to determine the nature of an attribute. This methodology provides understanding of the satisfaction-performance relationship that may impact resource allocation. The methodology is an empirical process that transforms qualitative customer satisfaction data into a decision tool. Utilizing the relative impact graph, the impact of attribute performance on satisfaction can be determined.

Traditional transportation decision tools implicitly assumed a direct linear relationship of attribute performance to bus transports operators' satisfaction, i.e. more/better performance equals more satisfaction. The tool developed here to determine the true relationship of performance-satisfaction is based upon product-based industry research findings. Using this tool in a transportation context requires specific alterations to the methodology. This research used transportation data to test the hypothesis that the impact of high performance differs from the impact of low performance on bus transports operators' satisfaction. The results support the hypothesis but the experimental design of the data used precludes confirmation of the hypothesis. However, the methodology and tools are confirmed as relevant in the transportation context and support the feasibility of the proposed bus transports operators' satisfaction framework.

The research conducted is exploratory which means the outcome and contribution are more perspective based. Although a valuable methodology is developed the true impact is the shift from customer satisfaction as a goal to customer satisfaction as a tool to transparency in decision making. The research question 'Is there an empirical bus transports operators' satisfaction analysis?' is confirmed. The hypothesis of a different impact of positive performance and negative performance on customer satisfaction is also supported but requires a modified experimental design to confirm. The proposed bus transports operators' satisfaction framework meets the criteria for feasibility and can seamlessly integrate within the existing transportation planning process.

CONCLUSION

The Researcher concludes that the Bus transports operators' satisfaction theories and applications in various fields to determine its value in transportation contexts. The

evidence of an asymmetrical nonlinear customer satisfaction relationship to attribute performance conflicts with current transportation decision tools and implicit assumptions of analysis tools in practice. We could determine these relationships provide a tool for linking Bus transports operators' satisfaction and decision making. This shift in perspective of Bus transports operators' satisfaction as a tool for decision making in transportation contexts can have broad impacts.

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